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REMARKS

In the Office Action the Examiner rejected claims 1-20, 27, and 30-34 pursuant to 35 U.S.C. §102(e) as anticipated by Ustuner, et al. (U.S. Published Application No. 2005/0033165). Claims 1-34 were rejected pursuant to 35 U.S.C. §103(a) as unpatentable over Ustuner, et al. in view of Sumanaweera, et al. (U.S. Published Application No. 2005/0093859). Applicants respectfully request reconsideration of the rejections of claims 1-34, including independent claims 1, 13, 16, 27, 30 and 34.

Independent claim 1 recites obtaining data from a plurality of transducer elements across a receive aperture, determining a coherence factor as a function of the data across the receive aperture, and setting a beamforming parameter as a function of the coherence factor.

Ustuner, et al. do not disclose these limitations. Ustuner, et al. adoptively suppress grating lobes (title; and abstract). In one embodiment of detecting grating lobes, the grating lobe energy is detected separately for each element or channel (paragraph 29). In an alternative, beamformed data is used (paragraph 30). Any coherence factor is for each channel or a sum of all channels. This embodiment of Ustuner, et al. does not determine a coherence factor as a function of data across the receive aperture.

In another embodiment, a coherence factor is determined between pairs of elements or channels (paragraphs 43-45). Virtual elements across an aperture contribute or not (paragraph 52). The contribution is independent for each virtual element, and each virtual element corresponds to a pair of actual elements (paragraph 47-48). Coherence factors are determined for each pair of actual elements, not as a function of data across the receive aperture.

Independent claim 13 recites a processor operable to determine a coherence factor across the array. Claim 13 is allowable for similar reasons as claim 1.

Independent claim 16 recites setting an image forming parameter as a function of the coherence factor, the image forming parameter being for synthesis, compounding, multibeam, a number of sequential beams, a number of sub-apertures, a number of focal zones or combinations thereof.

The Examiner did not rely on Ustuner, et al. alone for the number of sequential beams, sub-apertures or focal zones. Ustuner, et al. does not disclose these parameters and the combination of Ustuner, et al. with Sumanaweera, et al. is not appropriate, as discussed below.

Ustuner, et al. suggest setting a phase shift (paragraph 6), a gain (paragraph 6), an aperture size (paragraph 6), a frequency (paragraph 6), a weight (paragraph 27), a selection of data (paragraph 37), and an apodization (paragraph 39). None of these are synthesis, compounding, or multibeam. Ustuner, et al. does not disclose any of the listed parameters of claim 16 being set as a function of a coherence factor.

Independent claim 27 is allowable for the same reasons.

Independent claim 30 recites setting dynamic range, a nonlinear filter, or a nonlinear map as a function of the coherence factor. Ustuner, et al. provide a filter 30, such as a FIR band pass filter (paragraph 28). The process may select using the filter or not using the filter based on detected grating lobes (paragraph 37). Ustuner, et al. do not disclose a non linear-filter, and do not set a non-linear filter. There is also no suggestion to set dynamic range and a nonlinear map.

Independent claim 34 is allowable for the same reasons as discussed above for claim 30.

Dependent claims 2-13, 14-15, 17-20, and 31-33 depend from one of the independent claims discussed above, so are allowable for the same reasons. Further limitations distinguish from Ustuner, et al.

Claims 2 and 18 recite a ratio of a coherent sum to an incoherent sum. Ustuner, et al. use a ratio of a filter input to a filter output (paragraph 33). Filtering does not change the data from coherent to incoherent.

Claim 8 recites setting a sub-aperture size. Ustuner, et al. show setting the aperture size (paragraph 39), not a sub-aperture.

Claim 12 recites setting a complex aperture parameter of at least two profiles or sizes. Size and apodization are treated as alternatives by Ustuner, et al. (paragraph 39).

Claims 1-34 were rejected by reliance on 103(a) with Ustuner, et al. in view of Sumanaweera, et al. The present application was filed (March 31, 2004) before the publication or issuance of either Ustuner, et al. (February 10, 2005) or Sumanaweera, et al. (May 5, 2005). Both references are 102(e) references used for a 103(a) rejection. Both references are assigned to Siemens Medical Solutions USA, Inc. The present application, Ustuner, et al., and Sumanaweera, et al. were at the time of invention of the present application, owned by or subject to an obligation to assign to Siemens Medical Solution USA, Inc. Pursuant to 103(c)(1), claims 1-34 are allowable.


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CONCLUSION:

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 943-7554 or Craig Summerfield at (312) 321-4726.

PLEASE MAIL CORRESPONDENCE TO: Respectfully submitted,

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